

MOG 153 5001

UNIVERSITY OF CALIFORNIA
SCRIPPS INSTITUTION OF OCEANOGRAPHY

LIST OF CORES COLLECTED ON CAPRICORN (1952-53),
CUSP (1954) AND ACAPULCO-TRENCH (1954) EXPEDITIONS
Chubasco

1 May 1955

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CAPRICORN EXPEDITION: SPENCER F. BAIRD, 1952-53

- 1 BG: 1 Dec. 1952; 1°57'N, 169°29'E; depth, 4280 m; core length, 10 dm; sediment type, fine grained (calcareous ooze).

Recent coccolithophoridae at bottom of 1 BG.

- 1 BP: Some Late Tertiary discoasters.

- 2 BG1: 2 Dec. 1952; 0°43'N, 169°20'E; depth, 4320 m; core length, 9 dm; sediment type, buff, fine-grained calcareous ooze.

Gravity core has Recent forams at bottom (no discoasters).

- 2 BP1: Core length, 1 dm; sediment type, buff, fine-grained calcareous ooze.

Piston core encountered Late Tertiary siliceous ooze.

- 2 BP2: 2-3 Dec. 1952; 0°47'N, 169°12'E (basin north of Ocean Island); depth, 4270 m; core length, 60 dm; sediment type, fine-grained greenish-buff siliceous ooze at bottom.

Rare Late Tertiary discos, at bottom - many diatoms and radiolarians. Very little CaCO_3 .

- 2 BG2: Core length, 8 dm; sediment type, fine-grained buff calcareous ooze.

Recent Quaternary coccos and discos found in sediment.

- 3 BG: 4 Dec. 1952; 2°41'S, 170°46'E; depth, 3940 m; core length, 8 dm; sediment type, uniform buff, fine-grained calcareous ooze with forams.

Recent (Quaternary) coccos and forams at bottom.

- 4 BP: 4 Dec. 1952; 4°08'S, 171°46'E (broad swell SSE of Ocean Islands); depth, 3670 m; core length, 3 dm; sediment type, light calcareous ooze.

Forams common. Sediment includes Late Tertiary discos and forams (Candorbulina, etc.) in lower part and "Recent" near top.

- 4 BG: (approximate crest of broad topographic swell); core length, 13 dm; sediment type, uniform light calcareous ooze.

Many forams. Recent coccos and forams to bottom.

5 BG: 6 Dec. 1952; 9°03'S, 174°52'E (basin north of Alexa Bank); depth, 4960 m; core length, 7 dm; sediment type, red clay 0-35 cm, light calcareous ooze 35-65 cm, red clay 65-67.5 cm.

5 BP: Core length, 68 dm; sediment type, chocolate-brown red clay with calcareous ooze strata.

Three zones of graded calcareous material interbedded in clay.

6 BP: 7-8 Dec. 1952; 10°50'S, 174°03'E (base of scarp up to Alexa Bank); depth, 4390 m; core length, 44 dm; sediment type, calcareous ooze overlying clay.

7 B: Alexa Bank; sediment type, coarse calcareous sand. Halimeda and forams.

Depth, 30-41 m latitude: area 9°N of, 9°S of, 11°42'S.
Longitude: Area 5°E of, 5°W of: 174°22'E.

Other operations at station: Cap. 7 BA (Diving samples) near seismic C¹

Cap. 7 BB	}	Snapper samples.
Cap. 7 BC		
Cap. 7 BD		
Cap. 7 BE		
Cap. 7 BF (Diving samples) near seismic C ²		

8 BP: 10 Dec. 1952; 13°39'S, 174°58'E (one-third of way from Alexa Bank to Suva); depth, 2560 m; core length, 76 dm; sediment type, yellow-brown Globigerina ooze.

Forams at base not obviously different from top. Distinct change in water content downward from "mushy" in upper sections to gradually firmer at sect. 5 and below.

8 BG: Core length, 9 dm.

Recent forams in core catcher.

9 BG1: 18 Dec. 1952; 19°06'S, 177°41'E (24 miles S. Vatu Leile, Fiji); depth, 2720 m; core length, 8 dm; sediment type, greyish-greenish mud with forams.

9 BP1: Core length, < 1.

Pieces of pyroclastics and consolidated mudstone with forams.

9 BG3: 18 Dec. 1952; 19°01'S, 177°46'E (S. Vatu Leile, Fiji); depth, 2640 m; no core; sediment type, sandy, greyish-greenish mud.

9 BP2: Core length, 40 dm; sediment type, coarse sand, upwards changing to muddy fine sand.

- 9 BG2: 18 Dec. 1952; 19°03'S, 177°44'E; depth, 2580 m; core length, 4 dm; sediment type, greyish-green mud.
- 10 BG1: 20 Dec. 1952; 22°03'S, 178°34'E (S. of Fiji, Raitt Basin); depth, 3920 m; core length, 11 dm; sediment type, calcareous brownish clay.
- 10 BP1: Core length, 5 dm.
- Sequence apparently distorted and upper, presumably several meters thick, layer of unconsolidated clay is represented only by a few decimeters in the piston core.
- 10 BG2: 21 Dec. 1952; 22°03'S, 178°32'E; no core; sediment type, calcareous brownish clay.
- 10 BP2: Core length, 5 dm.
- 10 BG3: 22°01'S; no core.
- 10 BP3: 21 Dec. 1952; 22°01'S, 178°32'E (S. of Fiji, Raitt Basin); depth, 3920 m; core length, 7 dm; sediment type, calcareous brownish clay.
- 13 BG: 27 Dec. 1952; 20°00'S, 175°00'W (S. Topua Trough, Tonga Group); depth, 1682 m; no core; sediment type, sandy silt.
- Because of the high resistance of the sediment, the penetration seems to have been small and the corer to have toppled over, sucking up sediment when taken up again. Only an inch of sediment in gravity corer. All material in glass jars. Corer was rigged with tight-fitting piston, no free fall and no loops of wire.
- 13 BP: No core.
- 14 BG1: 28 Dec. 1952; 19°20'S, 174°52'W (S. Topua Trough, Tonga Group); depth, 1691 m; core length, 7 dm; sediment type, vesicular pebbles.
- The piston was taken out from the piston corer and the instrument was used as a gravity corer. No free fall. Low penetration caused by hard bottom. Latitude and longitude not corrected.
- 14 BG2: No core; sediment type, sandy silt with gravel.
- 14 BG3: No core; corer rigged as for 14 BG1 with free fall. Sediment apparently washed out and only a few pebbles of lava left. As counterweight was used the 1.5-inch gravity corer without tube, approx. 100 g of sediment stuck in the tube. Latitude and longitude not corrected.
- 14 BG4: 29 Dec. 1952; 19°39'S, 174°53'W; depth, 1710 m; no core.
- Gravity corer on hydrographic winch. Apparently hard bottom. Only a few angular lava fragments behind core catcher. Latitude and longitude not corrected.

15 BG: 29 Dec. 1952; 19°42'S, 173°49'W (East Lulunga Group, Tonga); depth, 3580 m; core length, 2 dm; sediment type, volcanic mud with forams.

15 BP: No core.

Piston corer was slightly bent, and the sediment in it was lost by washing.

16 BG: 29 Dec. 1952; 19°32'S, 173°38'W (Between Haano Island and Tonga Trench); depth, 4340 m; no core; sediment type, grey volcanic silty sand.

17 BG: 30 Dec. 1952; 19°55.5'S, 172°40'W (30 miles east of the Trench); depth, 5730 m; core length, 4 dm; sediment type, sandy, mud, volcanic.

<u>Interstitial Water</u>	<u>Water Above Sediment in Plastic Coring Tube</u>
SiO ₂ µgat/l = 103.00	SiO ₂ = 122 µgat/l
P ₂ O ₅ µgat/l = 5.00	P ₂ O ₅ = 2.17 µgat/l

18 BG1: 31 Dec. 1952; 20°18'S, 171°30'W; depth, 5360 m; no core.

18 BP1: Core length, 6 dm; sediment type, brownish-grey mud with sand and silt.

Gravity corer empty and tangled on piston corer. Clear water on top of piston corer.

18 BG2: 31 Dec. 1952; 20°10'S, 171°40'W; depth, 5400 m; core length, 1 dm; sediment type, brownish-grey mud with sand and silt.

18 BP2: Core length, 3 dm.

In spite of precautions taken (short core barrel P, short tube G, vertical wire, lead of G hanging in level with mouth of P), same trouble as in all cases after Suva.

19BG: 1 Jan. 1953; 20°30'S, 173°20'W (Tonga Trench); depth, 8820-9050 m; no core.

Kinks in wire caused drifting during approximately four hours with 9800 m cable out. Corer hit rock several times and lost tube. Lead weights were badly scratched by rock, and some fragments of basaltic glass stuck in the lead.

22 BG: 3 Jan. 1953; 19°33'S, 174°08'W (west edge of Tonga Trench); depth, 924 m; no core.

No recovery on first trial. Upon second trial (gravity corer) the sediment yielded small pieces of pumice and pteropode fragments. The third trial (snapper sample) gave larger (fine gravel) rounded pieces of vesicular lava.

23 BG: 3 Jan. 1953; 19°30'S, 173°51'W (west wall of Tonga Trench); depth, 2140 m; no core.

Only a fraction of a gram of sandy mud with forams, pteropods and perhaps volcanic material was retrieved. Latitude and longitude not corrected.

24 BG: 3 Jan. 1953; 19°28.5'S, 173°44'W (west wall of Tonga Trench, Pt. "Gloria"); depth, 2780 m; core length, 7 dm; sediment type, brownish-grey volcanic sandy mud with sand and silt layers.

Snapper sample consists of small amount of black volcanic sand. 24 BG best core since Tonga. Sample from catcher contains many rhabdoliths, coccos, forams and radiolaria. Latitude and longitude not corrected.

Interstitial Water (Sample stored at 30°C a week before extraction)

N_{NH_3} $\mu g/l$ 5230 Water content = 61 (38) per cent

N_{NO_3} $\mu g/l$ 30

SiO_2 $\mu g/l$ 7900

SiO_2 in bottom water = 124 $\mu g/l$

25 BG: 3-4 Jan. 1953; 19°27'S, 173°34'W (west wall of Tonga Trench); depth, 4020 m; no core.

No sign of the corer having hit bottom (though ball broke). Latitude and longitude not corrected.

27 BG: 4 Jan. 1953; 19°05.8'S, 173°12.8'W (west wall of Tonga Trench); depth, 4640 m; no core.

Corer apparently did not hit bottom. Ball not broken. Latitude and longitude not corrected.

28 B1: 6 Jan. 1953; 16°00'S, 173°47'W (700 yards from edge of reef at NW corner of Nivatobutabu, Tonga Is.); depth, 247-211 m; no core; sediment type, calcareous sand and gravel.

Sampling was carried out with 4 snappers and 2 pipe dredges. Approx. 1 liter sediment collected.

28 B2: (1700 yards from edge of reef on NW corner of Nivatobutabu); depth, 92 m; no core.

Two dredge hauls gave a few hundred grams of calcareous algal fragments, forams and calcareous sand.

28 B3: 6 Jan. 1953; 15°57'S, 173°47'W (1 1/3 miles SE of Tafahi Is.); depth, 274 m; sediment type, brownish-grey calcareous sand with algal fragments.

One pipe dredge haul.

29 BG: 10 Jan. 1953; 16°19'S, 168°35'W (SE of Samoa); depth, 4940 m; sediment type, brownish-grey clay.

Wire angle 15°. No ball breaker signal. Corer did not hit bottom. New trial in connection with bottom-water collection with big winch. All sediment, except traces, apparently had slid out of the barrel. Additional traces of sediment were recovered from the temperature probe.

30 BG: 13 Jan. 1953; 17°28'S, 160°59'W (west of Society Islands, northwest of Cook Islands); depth, 4710 m; core length, 5 dm; sediment type, chocolate-brown clay.

Manganese nodule on top of core. Sediment contains great amounts of manganese micronodules and crystals of phillipsite. Moderate amounts of fish teeth and phosphatic fragments. The manganese nodule resting on the top of the sediment was extracted and is stored separately in a glass jar. Lower 3.5 cm of core (above mouthpiece) used aboard for measurements. Bacterial samples extracted from surface sediment.

	<u>Supernatant water</u>	<u>Interstitial water</u>
SiO ₂ µgat/l	116	12000
N _{NH₃} µg/l	11.2	850
N _{NO₃} µg/l	7.8	2850

Water content of sediment 187 (65) per cent.
All interstitial water values refer to lowest 3 cm stratum.

31 BG: 14 Jan. 1953; 17°29'S, 158°40'W (west of Society Islands); depth, 4890 m; core length, 9 dm; sediment type, chocolate-brown clay.

The concentration of coarse material less than in core 30B. No fish teeth observed. A manganese nodule on top removed and stored separately. Bacterial sample taken from surface sediment.

32 BG: 20 Jan. 1953; 16°33'S, 147°01'W (northeast of Tahiti); depth, 4150 m; no core.

Wire angle 8°. Wire broken apparently 20 m above instrument. After ball breaker signal, approximately 20 m of extra wire was paid out. Several kinks in lowest part of wire.

33 BG: 22 Jan. 1953; 12°46'S, 143°33'W (Tuamotu-Marquesas); depth, 4380 m; core length, 13 dm; sediment type, chocolate-brown clay.

Contains phillipsite, manganese nodules, fish teeth and phosphatic fragments. The analysis of interstitial water carried out in the lowest part of the core (contents of mouthpiece and core catcher).

	<u>Supernatant water</u>	<u>Interstitial water</u>
SiO ₂ μ g/l	129	13130
N _{NH₃} μ g/l	180	2180
N _{NO₃} μ g/l	336	5300

Water content of sediment 230 (70) per cent.

- 34 BG: 23 Jan. 1953; 11°20'S, 142°25.5'W (southwest of Marquesas); depth, 4500 m; core length, 8 dm; sediment type, calcareous brown clay overlying brown clay.

Coarse-grained rock fragments, mineral grains, fish teeth, palagonite, manganese micronodules, phillipsite and fragments of foraminifera. Contents of mouthpiece and core catcher used for analysis of interstitial water.

	<u>Supernatant water</u>	<u>Interstitial water</u>
SiO ₂ μ g/l	132	9400
N _{NH₃} μ g/l	24	1320
N _{NO₃} μ g/l	228	333

Water content of sediment: 258 (72) per cent.

- 36 BG1: 28-29 Jan. 1953; 10°45'S, 133°35'W (east-southeast of Marquesas); depth, 4490 m; core length, 11 dm; sediment type, foraminiferal marl ooze 0-50 cm. Below this approximate level, brown clay.

- 36 BG2: Core length, 6 dm.

- 36 BP: Core length, 36 dm.

Phosphatic fragments, teeth, and a few sponge spicules in G1. Sediment scratched by core catcher in G1 and G2.

pH of water above sediment	7.45
pH of surface stratum of sediment	7.32

- 37 BG1: 30 Jan. 1953; 11°46'S, 128°55'W (Marquesas, Easter Island Rise); depth, 3900 m; core length, 11 dm; sediment type, calcium carbonate ooze interchanging with brown calcareous clay.

- 37 BG2: Core length, 10 dm.

- 37 BP: Depth, 4000 m; core length, 46 dm.

Longitudinal fractures in middle of G1. Stratigraphy similar to Swed. D. S. E. core 58. Lower strata contain well rounded grains with high refractive index and regular surface pattern.

- 38 BG1: 2 Feb. 1953; 14°16'S, 119°11'W (Marquesas, Easter Island Rise); depth, 3400 m; core length, 11 dm; sediment type, foraminiferal ooze, stratified; yellowish brown clay component.

- 38 BG2: Core length, 11 dm.

- 38 BP: Core length, 89 dm.
- 39 BG1: 4 Feb. 1953; 15°02'S, 113°49'W (Easter Island Rise); depth, 3400 m; core length, 14 dm, sediment type, ferruginous (Mn) foraminiferal marl ooze.
- 39 BG2: Depth, 2890; core length, 16 dm.
- 39 BP: Core length, 1 dm.

Ball signal obscured by noise from Horizon, which was alongside. Barrel was pulled out obliquely from the sediment. Core barrel bent and discarded. Only small amounts of sediment in piston corer (mason jar). The top 5 cm of G2 may be disturbed.

- 40 BG1: 5 Feb. 1953; 14°47'S, 112°08'W (Easter Island Rise); depth, 3020 m; core length 15 dm; sediment type, foraminiferal marl ooze.
- 40 BG2: Depth, 2950 m; core length, 13 dm.
- 40 BP: No core.

Presumably the piston corer was pre-tripped and only partially penetrated into the bottom. As a result, it was bent by the weights. No sediment was retrieved.

Acetate core catcher stapled into G1 (staple later removed).

Supernatant water

SiO ₂	132 µgat/l
N _{NH₃}	113 µg/l
N _{NO₃}	226 µg/l

- 41 BG1: 6 Feb. 1953; 13°33'S, 113°21'W (Easter Island Rise); depth, 2940 m; core length, 18 dm; sediment type, ferruginous foraminiferal ooze clay.
- 41 BP: Core length, 83 dm.

Low concentration of volcanic shards. Acetate core catcher in G. Piston core barrel bent, but sediment was extruded from bent tube. No ball breaker signal.

Supernatant water

N _{NH₃} µg/l	236
N _{NO₃} µg/l	158

Interstitial

Core	Depth cm	N _{NH₃} µg/l	N _{NO₃} µg/l	% H ₂ O	SiO ₂ µgat/l
41BG	176	2.4	0.35	155	12.4
41BP	537	2.0	0.53	142	16.2
41BP	753	2.4	0.35	140	17.6

42 BG1: 8 Feb. 1953; 7°19'S, 118°40'W (Easter Island Rise, Equator); depth, 4230 m; core length, 13 dm; sediment type, foraminifera CaCO_3 ooze interchanging with brown clay.

42 BG2: Core length, 12 dm.

42 BP: Depth, 4200 m; core length, 70 dm.

Plastic liner of G2 could not be removed from barrel. The sediment was therefore extruded and packed in mailing tubes.

Supernatant water

N_{NH_3} $\mu\text{g/l}$ 83

N_{NO_3} $\mu\text{g/l}$ 128

SiO_2 $\mu\text{gat/l}$ 110

43 BG: 9 Feb. 1953; 3°56'S, 120°51'W (Easter Island Rise, Equator); depth, 4210 m; no core; sediment type, CaCO_3 --ooze interchanging with clay.

43 BP: Core length, 80 dm.

Carbonate ooze interchanging with clay in upper part. In lower part, the sediment was more homogeneous and slightly greenish at bottom. No ball signal. Wire overrun. Barrel bent at pulling out. No core in G, which is substituted by Cap. 44 BG.

44 BG: 9-10 Feb. 1953; 3°42'S, 121°03'W (Easter Island Rise, Equator); depth, 4170 m; core length, 13 dm; sediment type, chalk ooze.

Supernatant water

N_{NH_3} $\mu\text{g/l}$ 164

N_{NO_3} $\mu\text{g/l}$ 170

SiO_2 $\mu\text{gat/l}$ 141

45 BG1: 10-11 Feb. 1955; 0°25'S, 123°26'W (near equator); depth, 4350 m; no core; sediment type, chalk-marl ooze.

45 BG2: Core length, 13 dm.

No ball breaker signal for G1. Wire overrun. Core G1 lost. G2 taken instead. Core developed longitudinal cracks.

46 BG1: 11 Feb. 1953; 0°11.5'N, 123°27'W (near equator); depth, 4290 m; no core; sediment type, chalk-marl ooze.

- 46 BG2: Depth, 4300 m; core length, 9 dm.
- No ball breaker signal wire overrun. G1 lost. New trial, again gave no signal; wire was overrun and kinked; however, the core was retrieved (G2).
- 47 BG: 11-12 Feb. 1953; 0°40'N, 123°37'W (near equator); depth, 4230 m; core length, 10 dm; sediment type, chalk-marl ooze.
- Good ball breaker signal. Digging mollusc near surface.
- 48 BG1: 13 Feb. 1955; 5°49'N, 124°02.5'W (North Equatorial - carbonate facies); depth, 4125 m; core length, 14 dm; sediment type, marl ooze interchanging with chalk ooze.
- 48 BG2: Depth, 4150 m; core length, 16 dm.
- 48 BP: Core length, 5 dm.
- No ball breaker signal for G1; wire tangled. Plastic water bottles filled with sediment. Ball breaker signal for P and G2, but the piston wire had slipped through the clamp; the piston moved to the top of the barrel before penetration into the bottom. P therefore, represents shortened and distorted sequence.
- 49 BG: 14 Feb. 1953; 9°17'N, 124°09'W (North Equatorial clay facies); depth, 4410 m; core length, 16 dm; sediment type, clay, light yellowish-grey resting on dark grey clay.
- 49 BP: Core length, 86 dm.
- 50 BG1: 16 Feb. 1953; 14°55'N, 124°12'W (North Equatorial clay facies); depth, 4270 m; core length, 6 dm; sediment type, buff-grey clay, discontinuously resting on reddish-brown clay.
- 50 BG2: Depth, 4260 m; core length, 15 dm.
- 50 BP: Core length, 82 dm.
- Fairly rough, hilly topography. Riedel claims lower Tertiary age of lower formation. Brown clay partly rich in phillipsite.

CAPRICORN - HORIZON 1952-53

- H1: 28 Nov. 1952; 2°06'N, 169°01'E; depth, 4320 m; core length, 11 dm; sediment type, light brown calcareous ooze.

The sediment is very fine grained except for perhaps 15-20 per cent of forams in core catcher sample. Forams appear to be modern.

- H2: 30 Nov. 1952; 0°47'S, 168°47'E; depth, 4177 m; no core.

Great deal of trouble with the winch coils in the rheostat room; while reeling in, only about 500 meters could be taken in at a time owing to abnormal heating of coils.

- H3: 2 Dec. 1952; 0°00', 168°35'E; depth, 4364 m; core length, 8 dm; sediment type, light brown calcareous ooze.

Core catcher sample fine grained except for 10-20 per cent forams. Radiolarians in the core catcher sample are predominantly (if not completely) Recent.

- H4: 4 Dec. 1952; depth, 3900 m; no core.

No indication of having reached bottom.

- H5: 4 Dec. 1952; 3°11'S, 171°15'E; depth, 3882 m; core length, 8 dm; sediment type, light brown calcareous ooze.

Foram content of approximately 20-30 per cent (in core catcher sample). This sample shows radiolarians which are predominantly (if not completely) Recent. Ten centimeters of core above the core catcher slid out of the liner as a unit and are stored in a glass bottle.

- H6: 4 Dec. 1952; 4°15.5'S, 171°55.5'E; depth, 3363 m; core length, 10 dm; sediment type, light brown calcareous ooze.

At the bottom about 20 per cent forams. The radiolaria in the core catcher sample are predominantly Recent.

- H7: 4 Dec. 1952; 5°13'S, 172°28'E; depth, 4600 m; core length, 12 dm; sediment type, calcareous ooze.

- H8: 5 Dec. 1952; 6°10'S, 172°55.5'E; depth, 5420 m; core length, 8 dm; sediment type, plastic red clay.

2.5 cm slipped out of the liner, and 79 cm remained in the liner.

Dredge haul (1): 8 Dec. 1954. Dredge over 720 m. Sediment full of coralline mud.

Dredge haul (2): Region along flank of Alexa-Penguin Bank.

2650 m. No bedrock. No core.

- H9: 16 Dec. 1952; 18°35'S, 177°05'E; depth, 3000 m; core length, 9 dm; sediment type, upper 7 cm clay. 50 cm pyroclastic material, 30 cm finer pyroclastic material and bluish clay.

Tangle of wire caught in sheave and broke. Lost coring rig and 150 m of wire. Second try, a good core. Sample from bottom of core yields many coccoliths (Recent), a few upper Miocene discoasters, a few radiolaria, and much fine pyroclastic mineral matter.

Dredge haul (3): 16 Dec. 1954. Dredging top of rise due west of core station where Core 9 was taken. 3690 m. Sediment contained one handful of rounded pumice pebbles. The pipe dredge yielded some coarse-grained material.

- H10: 17 Dec. 1952; 18°43'S, 175°41'E; depth, 2120 m; core length, 6 dm; sediment type, brown clay.

Sediment feels as if it has coarser (? pyroclastic) material with it. Not examined microscopically.

- H11: 17 Dec. 1952; 19°05'S, 175°59'E; depth, 4150 m; core length, 3 dm; sediment type, pyroclastic silt.

The sediment yields many coccoliths, some discoasters (? upper Miocene) and some forams and radiolaria. (This refers to the core catcher sample).

Dredge haul (4): 19°02'S, 175°56'E; depth, 2700 m. Basaltic pebbles, tuffaceous mud and coralline mud. One bottle of coarse gravel and sand from pipe dredge.

- H12: 19 Dec. 1952; 20°25'S, 178°14'E; depth, 3600 m; core length, 11 dm; sediment type, light brown ooze.

The core catcher sample, coccolith-foraminiferiferous ooze with no discoasters.

- H13: 20 Dec. 1952; 21°25'S, 177°46'E; depth, 3840 m; core length, 11 dm; sediment type, brown clay.

A small Mn nodule was found at the top of core. Core catcher sample contains large number of coccoliths, rhabdoliths; but no discoasters were observed. Radiolaria in core catcher sample, well preserved, Recent.

Dredge haul (5): 27 Dec. 1952; 20°47'S, 175°03'E (Tongatabu shelf, Tonga "bank"); depth, 68 m; grab sample of shell sand (coarse) and small (1-inch) pieces of calcareous rock.

Dredge haul (6): 27 Dec. 1952; 20°40'S, 175°03'W (west margin of Tonga bank); depth, 62 m; three pieces of calcareous rock.

Dredge haul (7): 27 Dec. 1952; 20°36'S, 175°00'W; depth, 92 m; good haul, predominantly pinkish, purplish in color, algal pebbles and cobbles, and nearly all with lithothamnion crust,

even shells encrusted. Forams of Marginulina type some the size of a silver dollar and many smaller ones, living corals with symbiotic (?) green algae clearly visible in depressions. Solitary corals. Halimeda in vast quantities, red and green algae (of the seaweed variety), sponges (small). Total weight about 60 lbs.

Dredge haul (8): 1 Jan. 1954; 21°17'S, 174°15'W; depth, 3300 m; 5 pieces of pumice and 2 pipe dredges full of sand.

Dredge haul (9): Dredge lost.

Dredge haul (10): No haul.

Dredge haul (11): Dredge lost.

H14: 27 Dec. 1952; 20°53.5'S, 174°56'E; depth, 630-530 m; core length, 2 dm; sediment type, calcareous sand.

H15: 3 Jan. 1953; 18°34'S, 172°11'W; no core.

H16: No core.

H17: 5 Jan. 1953; 16°20.5'S, 172°54'W; depth, 3390 m; no core.

H18: 5 Jan. 1953; 16°06.5'S, 172°55'W; depth, 2765 m; core length, 1 dm.

Very hard, consolidated sand core.

H19: 10 Jan. 1953; 16°05'S, 169°15'W; depth, 5340 m; core length, 11 dm; sediment type, top 50 cm consolidated reddish clay; below, greyish muddy silt.

A sample from the lowest part of the core contains volcanic glass fragments and radiolaria which are mostly (if not completely) Recent. A few forams.

H20: 10 Jan. 1953; 16°15'S, 166°44'W; depth, 5600 m; no core.

H21: 12 Jan. 1953; 16°36'S, 162°43'W; depth, 5125 m; core length, 9 dm; sediment type, chocolate clay.

Sieved sample from bottom contains many zeolites, and some mineral fragments, fish teeth, and other phosphatic and calcareous remains and perhaps clay aggregates representing radiolaria.

H22: 12 Jan. 1953; 16°40'S, 162°15'W; depth, 4675 m; no core.

Snarls in the last 100 m of wire which was subsequently cut off. No core except for a couple of tiny pieces of MnO₂.

H23: 12 Jan. 1953; 16°58.5'S, 161°35'W; depth, 5140 m; core length, 8 dm; sediment type, chocolate clay.

H24: 13 Jan. 1953; 16°44'S, 161°22'W; depth, 4685 m; core length, 7 dm; sediment type, chocolate clay.

Sieced material from the core catcher shows much zeolite, some calcareous and phosphatic fragmentary organic remains, and perhaps some mineral grains. There is much manganese oxide of sand size.

H25: 14 Jan. 1953; 16°53'S, 159°08'W; depth, 5040 m; core length, 9 dm; sediment type, chocolate clay.

H26: 15 Jan. 1953; 17°36'S, 152°52'W; depth, 4117-4355 m; core length, 1 dm; sediment type, gritty clay.

Core barrel dented, core nose lost. In the core barrel there remained 8.5 cm of compacted, gritty MnO₂ clay. Examination of untreated material shows manganese oxide, clay, mineral grains, (?) corroded zeolites.

H27: 21 Jan. 1953; 14°50'S, 146°08'W; depth, 2763 m; no core.

H28: 21 Jan. 1953; 14°01'S, 145°12'W; depth, 4430 m; core length, < 1 dm; sediment type, white, gritty sediment.

Core consists of white (?calcareous) gritty sediment with a thin (about 1 mm) MnO₂ crust--placed in a mason jar. Sediment examined untreated. No discoasters seen, only a very few coccoliths.

H29: 21 Jan. 1953; 13°58'S, 145°10'W; depth, 4365 m; sediment type, gritty chocolate clay.

A lot of sediment slipped out past the catcher.

H30: 22 Jan. 1953; 11°59'S, 142°17'W; depth, 4575 m; core length, < 1 dm; sediment type, chocolate clay.

Corer aboard but with only a small amount of chocolate clay (about 300 ml) in the bottom of the liner. Water poured out of the liner, past the sediment. The entire sample placed in a mason jar.

H31: 23 Jan. 1953; 12°12.1'S, 143°24'W; depth, 4630 m; core length, < 1 dm; sediment type, chocolate clay.

Corer aboard but with no sample except for a little chocolate clay smeared on the outside of the barrel. As there was no mud caught in the catcher (a brass one and a cellulose acetate one), it seems unlikely that the corer ever penetrated sediment. The mud smeared on the barrel is preserved in a small jar.

- H32: 29 Jan. 1953; 11°00'S, 130°24'W; depth, 4245 m.
Ball not broken. Good core.
- H33: 29 Jan. 1953; 10°57.8'S, 130°29.5'W; depth, 4040 m.
- H34: 29 Jan. 1953; 10°54.7'S, 130°31'W; depth, 3900 m; no core.
Wire snapped. Corer lost.
- H35: 29 Jan. 1953; 10°59'S, 130°13'W; depth, 4025 m.
- H36: 29 Jan. 1953; 11°00'S, 130°06'W; depth 4320 m.
- H37: 31 Jan. 1953; 13°05'S, 124°16.8'W; depth, 3850 m; sediment type, muddy coccolith-rhabdolith ooze.
- H38: 1 Feb. 1953; 14°16.4'S, 120°40.8'W; depth, 3590 m.
- H39: 2 Feb. 1953; 14°43'S, 120°01'W; depth, 3660 m; sediment type, foraminiferal clay.

Core catcher sample contains coccos, rhabdoliths, and an occasional Miocene discoaster.
- H40: 2 Feb. 1953; 15°13.1'S, 117°30.4'W; depth, 3550 m.
- H41: 3 Feb. 1953; 15°55.5'S, 117°13.8'W; depth, 3394 m.
- H42: 4 Feb. 1953; 15°39'S, 114°18'W; depth, 3221 m.

The core extended above the top of the liner, and a few cm (probably) dropped into the water when the barrel was removed.
- H43: 4 Feb. 1953; 15°37'S, 114°22'W; depth, 3166 m; sediment type, muddy ooze.

The core extended above the liner, and it is estimated that 10-15 cm dropped into the water when the barrel was removed, though we tried to catch it. The core catcher sample (and probably the whole core) is a rather muddy coccolith, foram., rhabdolith ooze.

Dredge haul: dredge lost owing to winch failure.
- H44: 4 Feb. 1953; 14°22'S, 112°59'W; depth, 2580 m.
- H45: 5 Feb. 1953; 14°29'S, 112°52'W; depth, 2983 m.
- H46: 6 Feb. 1953; 12°03'S, 113°24'W; depth, 3276 m.

The core extended beyond the top of the liner and approximately 3-6 cm fell into the water when the barrel was removed. A top sample (taken out of the top of the liner), and a core catcher sample are preserved in mason jars.

In order to prevent mishaps like the recent losses of the top part of cores, a flange 9" in diameter was brazed to the core barrel about 9" below the top of the barrel. This will prevent the corer from penetrating the sediment to above the top of the liner.

H47: 6 Feb. 1953; 10°44'S, 114°23'W; depth, 3495 m; sediment type, calcareous ooze.

H48: 7 Feb. 1953; 8°29'S, 116°29'W; depth, 4380 m.

H49: 9 Feb. 1953; 5°38'S, 120°28'W; depth, 4390 m; no core.

First try: no sign of having hit bottom. Second try: core nose a little flattened, probably hit hard bottom.

H50: 9 Feb. 1953; 4°23'S, 121°12'W; depth, 4210 m; core length, 14 dm; sediment type, calcareous ooze.

Core only 141.5 cm long.

H51: 9 Feb. 1953; 3°30'S, 121°57'W; depth 4355 m; core length, 12 dm. Cocco, rhabdos, but no discos observed. Many fine rads, apparently pure Recent. Core sent to Wiseman.

H52: 10 Feb. 1953; 2°02'S, 122°48'W; depth, 4430 m; no core.

Cable broke.

CUSP - 1954

- 1G: 25 July 1954; 31°05'N, 135°24'W; depth, 4940 m; core length, 11 dm; sediment type, red clay.
- 2G: Depth, 5160 m; core length, 12 dm; sediment type, red clay.
- 3G: 31 July 1954; 40°56'N, 125°38'W; depth 3110 m; core length, 10 dm; sediment type, green mud.
- 4G: 1 Aug. 1954; 39°30'N, 125°52'W; 3733 m; core length, 13 dm; mixed green mud and red clay.
- 5P: 3 Aug. 1954; 43°00'N, 134°27'W; depth, 3920 m; core length, 24 dm; sediment type, grey-green mud.
- Whole of core very fluid. Nothing in pilot corer. Sample should be treated as a grab sample because of extreme fluidity.
- 6P: 4 Aug. 1954; 43°45'N, 137°06'W; depth, 4090 m; core length, 93 dm; sediment type, grey-green mud.
- 7G: Core length, 2 dm; sediment type, brownish-grey mud.
- This material is browner than the deeper material from the piston core sample.
- 8P: 5 Aug. 1954; 43°58'N, 140°38'W; depth, 4350 m; core length, 49 dm; sediment type, brown mud; bottom 15 1/2" calcareous ooze.
- Bottom 19 1/2" (including material in core catcher) was white. Remainder of core was tan. A manganese nodule was found at the top and put in a plastic vial.
- 9G: Core length, 11 dm; sediment type, tan oceanic clay. Top several inches are darker.
- 10P: 6 Aug. 1954; 45°34'N, 143°11'W; depth, 4590 m; core length, 85 dm; sediment type, greyish mud.
- 11G: Core length, 14 dm; sediment type, greyish mud fairly brown near surface.
- 12P: 7 Aug. 1954; 43°49'N, 143°07'W; depth, 4300 m; core length, 83 dm; sediment type, top 25 cm tan clay; remainder white ooze.
- 13G: Core length, 12 dm; sediment type, tan clay.
- 14G: 7 Aug. 1954; 43°49'N, 143°07'W; depth, 4270 m; core length, 12 dm; sediment type, tan clay.

- 15P: 9 Aug. 1954; 37°15'N, 143°07'W; depth, 5220 m; core length, 87 dm; sediment type, fairly dark brown clay.
- Numerous manganese nodules.
- 16G: 9 Aug. 1954; 37°15'N, 143°07'W; depth, 5220 m; core length, 15 dm; sediment type, fairly dark brown clay.
- 17G: Depth, 5260; core length, 15 dm; sediment type, fairly dark brown clay.
- 18G: 10 Aug. 1954; 35°05'N, 142°31'W; depth, 5290 m; core length, 14 dm.
- 19G: Depth, 5261 m; core length, 15 dm.
- Prepared for Biochemistry.
- 20G: Depth, 5190 m; core length, 14 dm; sediment type, red clay.
- For NEL.
- 21G: 12 Aug. 1954; 34°27'N, 134°15'W; depth, 5070 m; core length, 14 dm; sediment type, red clay.
- 22G: Depth, 5120 m; core length, 14 dm; sediment type, red clay.
- 23G: 14 Aug. 1954; 34°29'N, 126°02'W; depth, 4650 m; core length, 15 dm; sediment type, brown top 3 1/2 inches. Grey at bottom. Greenish-grey in between.
- 24G: Core length, 15 dm.

ACAPULCO TRENCH EXPEDITION (CHUBASCO) - 1954

- 1: 15 Oct. 1954; 19°00'N, 121°52.8'W; depth, 4138 m; core length, 14 dm; sediment type, greyish-brown, plastic clay.

Course 239, microrough bottom with occasional sea highs. One half hour before station, ship passed over approximately 100 F high rise; after this, smooth bottom at 2287 F. Five minutes before turn, bottom rose and in 5 min. came up to 2265 F. Ship turned around 180° and headed 059° for 10 min. at 7.5 knots. Bottom went back to 2283 F and station was made. During station, bottom rose again to 2262 F when the ball broke. 4250 m of wire out. (Depth, 4138 m.) After station, again microrough topography with highs 30-60 F and 1.5-2.5 miles broad. 30 miles south, very rough topography starts.

Top of core marred by catcher. Catcher content in mason jar. Manganese nodule on top left in place. Penetration 71".

- 2 16 Oct. 1954; 1919 GMT; 16°02'N, 125°01'W; depth, 4354 m; core length, 6 dm; sediment type, brownish-grey clay.

Course 210, speed 11. After passing California seamount, very smooth undulating bottom, 2300-2400 F with occasional seaknolls and fairly frequent small highs. Shortly before 1800 h the bottom dropped down to 2400 F and thereafter rose to approximately 2380 at 1825 h. 3 small highs, 50, 30 and 30 F at 1830, 1836, and 1848 h. Base approximately 1 mile each. 1852-1905 h very smooth, 2379-2383 F at 1903 h start of drop from 2380 F to 2388 F at 1905 h. Immediately thereafter a small high and course was reversed to 030° with retained speed. Station made 7 min. back in the smooth. Depth, 2381 F at ball signal (4354 m). 4505 m of wire out. Ship drifted back towards high during station and core seems to have been raised from position approx. identical with one at 1903 h. After station, gently undulating bottom slowly sloping downward and crossing the 2400 F line after about an hour's station over 2145.

Sediment brittle and fracturing on top. Manganese nodule at surface. Sediment very rich in sand-sized Mn-micronodules with nuclei of clayey material which seems to grade into altered glass. Approx. 5 in. slid out of the liner when corer was being taken aboard. Penetration approx. 70". Contents of catcher and nose in mason jar

- 3: 17 Oct. 1954; 0335 GMT; 15°00'N, 125°26.1'W; depth, 4380 m; core length, 15 dm; sediment type, brownish-grey clay.

Course 202, 11.5 knots. Smooth undulating bottom with small sea highs, one 60 F high and 2 miles broad occurring at 0243 h. Before station, bottom dropped to 2395 F. Ship turned around 180° and ran back 5 min. Ball break at 2395 F. A loop of wire tangled around the breaker and tore loose with a jerk at the surface. The top 1/2 cm of sediment was shaken up a little. Underway 0530 h. After station, gently undulating bottom.

Sediment low in coarse material. Penetration, approximately 70". Water saved.

- 4: 17 Oct. 1954; 1047-1244 GMT; 14°01.5'N, 125°29.5'W; depth, 4505 m; core length 17 dm; sediment type, buff clay.

Course 183°, 11.5 knots. Gently undulating bottom. Sea high, 30 F at 0810 h 4 miles broad. At 0900 h, 2340 F, gradually descending bottom to 2485 F at 1040 h. Course reversed to 003° at 1045 h. Ship lay to at 1047 h, 2480 F. Edo read 2480 until approximately 1120 h, when it started to ascend and reached 2440 F at 1200 h.

Sediment mottled and diffusely stratified (top 5 cm dark, approx. 5-15 light, approx. 15-20 dark).

- 5: 17 Oct. 1954; 1825-2018 GMT; 13°03.1'N, 125°28.8'W; core length, 10 dm; sediment type, greyish-brown clay.

Gently undulating bottom. From 2525 F at 1700 h, bottom, rose gradually to 2430 F at 1815 h. Course 180°, 11.5 knots. At 1817 h, course was reversed and ship moved back 8 min. over the 2430 F plateau. A sharp side echo appeared 1820-1823 h, but disappeared again. At 1925 h the ship lay to at station. 1905 h at 2431 F, corer was supposed to have hit bottom. No ball signal at 1950 h and the depth had increased to 2441 F. Apparently the core was raised from the slope. After station, on course 180°, 11.5 knots, bottom started rise suddenly from 2435 F at 2030 h to 2370 on top of high. At 2130 h the depth was 2500 F.

The core contained a manganese crust on top. Part of crust kept in jar. Mn and sand settling down along walls of liner. Clay in mouthpiece brittle. No CaCO_3 in mouthpiece clay. Water saved.

- 6 18 Oct. 1954; 0213-0414 GMT; 12°03.2'N, 125°30.5'W; depth, 4636 m; core length, 16 dm; sediment type, light buff clay.

Poor bottom echo due partly to interference with scattering layer, but seems to be gently undulating around 2530 F. Ball signal at 2535 F 0252 h.

Core stratified as core 4. Water saved.

- 7 18 Oct. 1954; 0947-1222 GMT; 11°10.1'N, 125°34'W; depth, 4645 m; core length, 16 dm; sediment type, light buff clay.

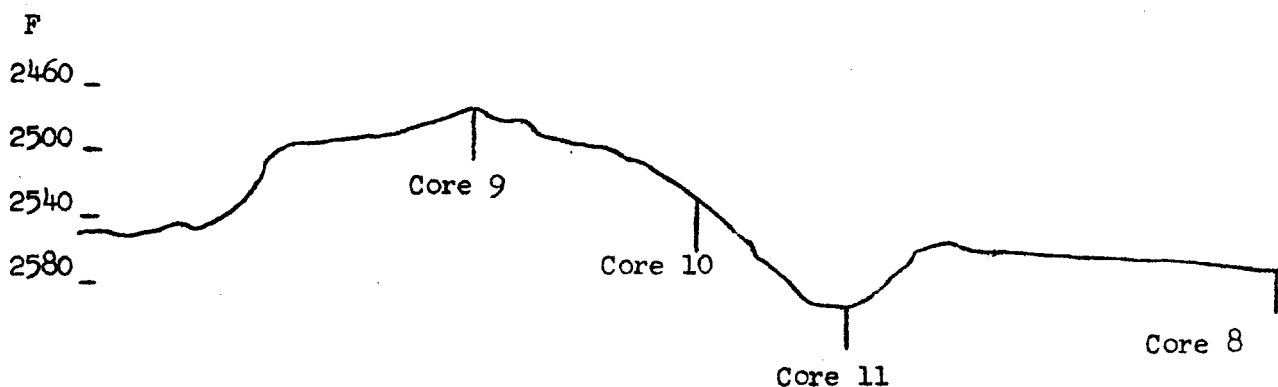
Topographic description identical to that of core 6, 2540 F. Ball signal at 1023 h at 2540 F.

Sediment stratified as in core 4. Possibly more digging structures. Water saved. Mouthpiece contents in mason jar possibly contaminated by falling into the sink.

- 8: 18-19 Oct. 1954; 1812-0052 GMT; $10^{\circ}13.5'N$, $125^{\circ}25.3'W$; depth, 4720 m; core length, 16 dm; sediment type, light buff clay.

Topography similar to that of core 7. A ridge with a top depth of 2475 F was passed a couple of miles before station, and was later surveyed. No ball signal. Winch trouble on the way up delayed the operation. 1-2 cm of sediment in dummy above liner was lost.

- 9: 19 Oct. 1954; surveying started 0052 h; $10^{\circ}18.5'N$, $125^{\circ}27.2'W$; depth, 4545 m; core length, 10 dm; sediment type, dark buff clay.



Together with cores 8, 10 and 11, core 9 was raised from a topographically pre-surveyed area. This area contains a ridge (summit extending locally to 2470 F from general level of 2500 F) running NNE - SSW, limited to the east by a 2585 F deep trough and an undulating plain at 2550 F, and to the west by a similar plain at approximately 2540 F. Core 9 was aimed at the highest spot of the ridge and may have hit this or close by on the top level plane.

Color stratification appears to be the same as in other buff cores but light-colored stratum below dark top appears to be thinner in this core. Manganese micro-nodules frequent. A large furrow extends along the wall from near the top, approximately 30 cm downward (marked on liner) and material from top flows down in this furrow (? apparently a Mn nodule, location marked on liner). The furrow does not appear to be caused by the core catcher; the corresponding finger does not spring back enough to explain the structure. Most probably it is a digging channel. Several smaller ones are seen in cross section along the core. Bottom of core is quite brittle. No $CaCO_3$ at top or bottom. Possible unconformity approximately 20 cm from bottom with buff above, brown below. Water saved. Core catcher contents in mason jar. For topographic detail, see special survey.

- 10: 19 Oct. 1954; 10°21.4'N, 125°26.3'W; depth, 4645 m; core length, 12 dm; sediment type, dark buff clay.
- This core was aimed at the steepest part of the slope and hit this somewhere between 2530 and 2550 F.
- The sediment is stratified with worm channels and unconformity apparently overlying dark brown indurated clay. Water saved.
- 11: 19 Oct. 1954; 10°21.9'N, 125°24.7'W; depth, 4730 m; core length, 18 dm; sediment type, light buff clay.
- The top 1 cm of the contents of the liner was dried out and saved in a glass jar.
- Operations in the area (8-11) completed at 2250 h 19 Oct.
- 12: 20 Oct. 1954; 0532-0752 GMT; 9°15.5'N, 125°26.7'W; depth, 4540 m; core length, 53 dm; sediment type, dark greyish-brown with light buff strata.
- Gently undulating bottom 2450-2490 F. Core raised from intermediate depth (2475 F). Water saved.
- 13: 20 Oct. 1954; 0905-1206 GMT; 9°03.1'N, 125°21.6'W; depth, 4480 m; core length, 14 dm; sediment type, buff clay.
- Gently undulating bottom at 2485 F shoaling to 2465 where the ship lay to on station, and to 2450 when ball broke. 35 min. later the depth had again increased and was 2470 F. Core thus raised from a topographic high.
- The sediment appears normally stratified--dark, light, dark. Water saved.
- 14: 20 Oct. 1954; 1328-0245 GMT; 8°44.4'N, 125°29.0'W; depth, 4536 m; core length, 17 dm; sediment type, buff clay.
- Gently undulating bottom (\pm 15 F). Long time caused by two unsuccessful attempts. Core raised from very slight high (2470 F) above surrounding 2475.
- Core normally stratified. Water saved.
- 15: 21 Oct. 1954; 0600-1049 GMT; 8°30.7'N, 125°25.4'W; depth, 4462 m; core length, 85 dm; sediment type, dark buff clay over coccolith ooze.
- From station 14, bottom continued to undulate between 2460 and 2470 F. When corer hit bottom, however, the ship had drifted in over a slope (2470 F, 0723 h; 2435 F, 0830 h, drift speed approx. 2 knots) and the core was probably raised from a depth of 2440 F. The slope borders a plateau over which the ship continued under way to station 16.

<u>Time</u>	<u>Depth</u>	<u>Time</u>	<u>Depth</u>
1050	2435	1145	2380
1100	2435	1150	2360
1110	2535	1155	2375
1120	2430	1200	2375
1125	2420	1205	2390
1130	2415	1210	2350
1135	2420	1215	2345
1140	2405		

Station 16

The clay sediment appears normally stratified, but compressed sequences resting, apparently unconformably on light grey, fine-grained calcareous ooze. Water saved.

- 16: 21 Oct. 1954; 1217-1625 GMT; 8°17.0'N, 125°19.2'W; depth, 4334 m; core length, 6 dm; sediment type, dark buff clay.

Core raised from plateau with undulating surface starting at station 15. Ball signal at 1411 h on a slope between 2360 (1400 h) and 2380 F (1430 h) at a depth of approximately 2370 F. After station, undulating plateau continued. A steep-walled trench was passed between 1812 h (drop from 2485 F, 1810 h to 2565 F at 1815 h) and 1827 h (rise from 2570 F, 1825 h to 2465 F 1830 h). In the trench was a 30 F high smooth rise.

Sequence of sediment like core 15 with a calcareous bottom, but the unconformity cannot be seen through the wall of the liner.

- 17: 22 Oct. 1954; 0025-0440 GMT; 8°05.0'N, 125°25.0'W; depth, 4453 m; core length, 2 dm; sediment type, white hard coccolith ooze.

Ship continued over the fairly irregular plateau which varied between 2450 and 2380 F. An unsuccessful attempt to core was made 1850-2322 h 21 Oct. and the final one after return to compensate for drift. During station plateau shoaled to 2425 F at 0130 h, thereafter sank to 2445 where core was raised. Because of wire angle and excess wire (total 5156 m) it is also possible that the core was taken on the slope down to this depth. Depth now decreased again to 2390 F at 0440 h and ship left station. After station depth varied between 2430 and 2450 F. At 0525 h ship passed in over a depression with irregular bottom varying between 2475 and 2515 F. At 0630 h the depression was passed, and bottom rose to 2320 F. Course was reversed to 030° at this point (0635 h), and ship returned back over depression and lay to station 18 at 0647 h.

The sediment shows irregular surface and is capped by thin layer of dark brownish-grey clay, which has partially flowed down along the wall of the liner. Water saved.

- 18: 22 Oct. 1954; 0646-1118 GMT; 7°54.9'N, 125°28.7'W; depth, 4609 m; core length, 17 dm; sediment type, buff-grey clay.

For the topography of approach, see core 17. During lowering, the ship drifted in to the middle of the trench where bottom was fairly even (2515-2520 F). Ball signal at 0903 h, 2520 F.

Sediment shows normal stratification. Sediment penetrated into dummy and 1/2 to 1" of top was lost. Sediment surface calcareous.

- 19: 22 Oct. 1954; 1330-1745 GMT; 7°41.4'N, 125°36.6'W; depth, 4416 m; core length, 16 dm; sediment type, calcareous surface.

At end of station 18 the bottom shoaled to 2440 F (1100 h). After station, depth increased again, and varied between 2450 (1125 h), 2480 (1135), 2580 (1140), 2390 (1312), and 2420 F (1330 h on station 19). On station 19, depth decreased from 2445 (1400 h) to 2415 F (1540 h ball signal), 2420 (1600), 2395 (1630) and then increased to 2400 (1700) and 2410 F (1730 h). After station 19 again deeper area, 2430 (1805), 2450 (1810), 2475 (1815), 2480 F (1820 h). Core was thus raised from a gentle slope.

Normal stratification. Worm channel with internal cast on cleavage surface above core catcher. Bottom part prepared with glycerin in mason jar. Cast exposed in bottom surface of core. Water saved.

- 20: 22-23 Oct. 1954; 2004-0015 h; 7°22.2'N, 125°30.0'W; depth, 4549 m; core length, 5 dm; sediment type, white hard coccolith ooze.

After station 19, bottom sank from 2430 F (1755 h) to 2480 (1820 h) and then varied between this and 2460 F until it started to rise rapidly at 1905 h from 2460 to 2180 F (1920 h). Another seaknoll of 2260 F followed 2000 h. The course was reversed for 4 min., whereafter the ship lay to station 20, aiming at drifting back over the valley between the seaknolls. This succeeded, and ball broke at 2153 1/2 h, 2485 F, on the lower part of the slope of knoll No. 2. The deepest point passed during drift was 2495 F at 2300 h. After station, two more knolls were passed at 0045 (2290 F) and 0100 (2330 F). Thereafter, smooth and gently undulating bottom 2455-2465 F up to station 21.

Sequence of core 20 as sequence in core 17. Worm holes frequent in chalk top and filled with the greyish-brown top clay. Water saved.

- 21: 23 Oct. 1954; 0216-0622 GMT; 7°05.5'N, 125°31.0'W; depth, 4565 m; core length, 14 dm; sediment type, stratified calcareous ooze.

For topographic approach, see description of core 20. During drift on station, depth increased from 2460 F (0216 h) to 2500 (0600 h). Ball signal 0419 at 2490 F. After station, bottom shoaled to 2420 F (0700 h) then sank again to 2495 (0730 h). Water saved.

- 22: 23 Oct. 1954; 0854-1253 GMT; 6°42.5'N, 125°34.2'W; depth, 4400 m; core length, 16 dm; sediment type, stratified calcareous ooze.

Gently undulating bottom around 2490 F. Rose slowly before station to 2410 F, and oscillated around approximately 2420 F several hours after station. Core was raised from 2410 F. Water saved.

- 23: 23 Oct. 1954; 1625-1818 GMT; 6°12.0'N, 125°27.2'W; depth, 4500 m; core length, 17 dm; sediment type, stratified calcareous ooze.

Undulating bottom between 2425 and 2480 F before station. One-half hour after station, bottom rose to the general level of 2410 F. Core raised from 2460 F.

Approximately 1 1/2 cm of top rose into dummy but was saved in a mason jar.

- 24: 24 Oct. 1954; 0132-0337 GMT; 5°28.8'N, 125°28.6'W; depth, 4530 m; core length, 3 dm; sediment type, tough, fine-grained calcareous ooze.

After several hours of undulating bottom around 2400 F, a knoll was passed, culminating 0055 at 2065 F, whereafter the bottom fell to 2480 F at 0120. Ship lay to station 24 at 0132, aiming at drifting back to the foot of the knoll. This succeeded and the corer hit at 2475 F, 0336 h. Thereafter the bottom rapidly shoaled as the ship drifted in over the slope.

Core capped by approximately 2 cm of dark greyish-brown clay with irregular and relatively consolidated surface (oblique). In the prepared core, the obliqueness is hidden by a washout from the top clay. Water saved.

- 25: 24 Oct. 1954; 1804-2240 GMT; 4°37.1'N, 125°25.5'W; depth, 4480 m; core length, 17 dm; sediment type, stratified calcareous ooze.

Gently undulating bottom 2390-2275 F. Core at 2445 F (1949 h) between 2475 (1830 h) and 2425 (2230 h). Water saved.

- 26: 25 Oct. 1954; start of survey for cores 26 and 27 at 0400 GMT; 3°32.7'N, 125°18.9'W; depth, 4417 m; sediment type, stratified calcareous ooze.
- For topographic detail, see special survey. A series of ridges 2380-2415 F separated by valleys, 2475-2480 F. Core 26 raised from crest of ridge at 2415 F. Water saved.
- 27: 26 Oct. 1954; 0100 GMT; sediment type, stratified calcareous ooze. Water saved.
- 28: 26 Oct. 1954; 1741-2230 GMT; depth, 4610 m.
- Van Veen sampler. Sample lost due to spinning of sampler on the way up. Sediment in weight stand and dummy saved as core 28.
- 29: 26 Oct. 1954; 2252-0217 GMT; 7°03.8'N, 126°24.3'W; depth, 4550 m; core length, 18 dm; sediment type, calcareous ooze.
- Calcareous core for study of organic matter. Stored, deep frozen, in a glass jar.
- 30: 27-28 Oct. 1954; 2202-0205 GMT; 7°17.7'N, 127°24.6'W; depth, 3640 m; core length, 5 dm; sediment type, calcareous ooze.
- Poseidon seamount. Core taken near summit of slope. 4450 m of wire were paid out, and it is not known how far behind the ship the corer trailed. The depth could, therefore, be somewhat greater.
- Calcareous ooze, rich in forams, unconsolidated, high in carbonate, stratified. Water saved.
- Calcareous material from bottom of core saved in plastic vial. Mouthpiece of corer dented.
- 31: 28 Oct. 1954; 0340-0819 GMT; 7°23.6'N, 127°17.0'W; depth, 4520 m; sediment type, stratified, calcareous (foram) ooze.
- Close to Poseidon. The seamount sits on a platform at 2400 F with a depression of 2470 F. Outside the platform, the depth is approximately 2560 F. The core was attempted in the depression. Barrel broke (no ball signal; 1100 m of extra wire were paid out) but material was retrieved from the weight stand and saved in four mason jars. The top 10 cm were put in a separate jar and are suitable for radiocarbon check on different size fractions because of the relatively high carbonate content.

- 32: 28 Oct. 1954; 0903-1427 GMT; 7°22.2'N, 127°17.0'W; depth, 4520 m; core length, 7 dm; sediment type, stratified calcareous ooze.

Repeated attempt close to position of core 31.

Water from above core saved. The top 10 cm look abnormal with fluid clay resting on foram-rich material. Graded on bottom or by washing around in liner? The latter alternative is possible as there was no ball break and approximately 1000 m of extra were paid out.

Fractures formed in core after sealing.

- 33: 28-29 Oct. 1954; 1758-0057 GMT; 7°42.5'N, 127°06.8'W; depth, 4540 m; core length, 16 dm; sediment type, stratified calcareous ooze.

Irregular topography with approximately 100 F relief. Core taken in depression (graben?).

Top 1-2 cm of core shaken up owing to dragging. Succession of top strata appears anomalous.

- 34: 29 Oct. 1954; 0244-0803 GMT; 8°00.6'N, 126°58.0'W; depth, 4440 m; core length, 13 dm; sediment type, top sediment slightly calcareous.

Irregular topography as in core 33. Core taken in topographic low.

The top approximate 10 cm were entirely shaken up when corer dragged along bottom (no ball signal, 1000 m of wire overpaid). Top 1 cm (very fluid owing to the shaking) lost. Corresponds to approximately 0.2 cm of normally compacted and dehydrated material.

The corer was apparently towed in horizontal position over old outcrops. Ball breaker contained coccolith ooze with flat manganese nodules, and between weight and flange of weight stand, was manganese encrusted clay. These two samples saved in separate mason jars, labelled 34 ball breaker and 34 weight stand.

- 35: 29 Oct. 1954; 0944-1413 GMT; 8°11.0'N, 126°58.4'W; depth, 4517 m; core length, 17 dm; sediment type, apparently non-calcareous.

Core taken in topographic low: Top approximate 2 cm disturbed during dragging. Water saved.

- 36: 29 Oct. 1954; 1545-2020 GMT; 8°20.7'N, 127°01.1'W; depth, 4570 m; sediment type, normally stratified buff clay.

Core taken in topographic low. Water saved.

- 37: 29-30 Oct. 1954; 2207-0231 GMT; 8°37.2'N, 126°57.2'W; depth, 4555 m; sediment type, normally stratified buff clay.

Core raised from a topographic low. Water saved.

- 38: 30 Oct. 1954; 1951-2347 GMT; 8°11.6'N, 125°18.5'W; depth, 4315 m; core length, 2 dm; sediment type, hard calcareous sediment.

Irregular topography with hills 2360 F and deeper, intermediate terraces, and deeps down to approximately 2460 F. Features, approximately a mile broad, offer steep slopes. Area found suitable at previous crossing, for study of outcropping chalk presumably Tertiary. Core raised from top of high.

The stratigraphy of the sediment is similar to that of core 17. Surface of fine-grained, hard calcareous sediment highly irregular and penetrated by worm channels. On top, a thin capping of clay of greenish and brownish hues and with granular structure. Water saved.

- 39: 31 Oct. 1954; 0046-1055 GMT; 8°09.0'N, 125°19.5'W; depth, 4360 m; core length, 17 dm; sediment type, normally stratified buff clay.

Same area as core 38. See special topographic survey. No ball signal. 5250 m paid out. Cable had to be cut and respliced at 4700 m but corer seems to have left bottom at the time, and there is no indication of extensive dragging on the bottom.

- 40: 31 Oct. 1954; 1250-1732 GMT; 8°06'N, 125°25.8'W; depth, 4415 m; core length, 5 dm; sediment type, bottom, hard white chalk ooze; top, greyish-buff clay.

Same area as cores 38 and 39. The great number of similar topographic features, the uncertainty about the drift here in the shear zone between the two currents, and the navigational difficulties, caused by the almost permanent overcast, made it uncertain whether the three cores were raised from one single topographic high and adjacent low.

Core 40 was raised from half way down the slope (2415 F) between the crest (4315 m, core 38) and the deep bottom. No ball signal; 5173 m paid out.

The transition between the bottom hard, white, chalk ooze and the top greyish-buff clay is not observable through the wall of the liner due to smear along the core.

For details of topography, see special survey.

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CHUBASCO EXPEDITION, Nov. - Dec. 1954

LIST OF CORES DESIGNATED BY ROMAN NUMERALS

- CHUB I g: 12 Nov. 1954; 21°04'N, 106°25'W; depth 2390 fm.; core length 103 cm.; brown silty clay.
- CHUB II g: 14 Nov. 1954; 19°04'N, 105°28'W; depth 2600 fm.; core length 98 cm.; brown silty clay.
- CHUB IV g: 20 Nov. 1954; 13°35'N, 91°35'W; depth 65 fm.; core length 140 cm.; brownish-grey calcareous silty clay.
- CHUB V g: 22 Nov. 1954; 13°09'N, 91°57'W; depth 3300-3370 fm.; core length 105 cm.; greenish-brown silty clay.
- CHUB V'g: 23 Nov. 1954; 12°52'N, 91°24'W; depth 3150-3270 fm.; core length 102 cm.; greenish-brown silty clay.
- CHUB V'p: 23 Nov. 1954; 12°52'N, 91°24'W; depth 3150-3270 fm.; core length 857 cm.; dark brown silty clay, somewhat calcareous.
- CHUB VI g: 24 Nov. 1954; 11°56'N, 91°43'W; depth 1950-1990 fm.; core length 107 cm.; greyish-brown silty clay.
- CHUB VII ag: 26 or 27 Nov. 1954; 11°30'N, 88°04'W; depth 2770-2800 fm.; core length 90 cm.; greyish-brown silty clay.
- CHUB VII g: 26 or 27 Nov. 1954; 11°30'N, 88°04'W; depth 2770-2800 fm.; core length 70 cm.; greenish-brown silty clay.
- CHUB VII p: 26 or 27 Nov. 1954; 11°30'N, 88°04'W; depth 2770-2800 fm.; core length 53 cm.; brown, diatomaceous silty clay.
- CHUB VIII g: 4 Dec. 1954; 9°48'N, 93°12'W; depth 1990-2030 fm.; core length 50 cm.; greenish silty clay.
- CHUB X g: 8 Dec. 1954; 11°38'N, 103°48'W; depth 1880-1940 fm.; core length 52 cm.; brown, highly calcareous clay with Mn fragments in the top few cm.
- CHUB XI g: 9 Dec. 1954, 10°53'N, 105°09'W; depth 1780-1800 fm.; core length 90 cm.; calcareous clay, dark brown at top, lighter below.
- CHUB XIII g: 13 or 14 Dec. 1954, 12°13'N, 111°03'W; depth 1875-2180 fm.; core length 106 cm.; brown silty clay.
- CHUB XIV p: 17 Dec. 1954; 21°58'N, 116°03'W; depth 2117-2130 fm.; core length 699 cm.; brown silty clay.